SKIN CONDUCTION AND TRANSPORT SYSTEMS

CLAIMS

We claim:

1. An electrode providing electrical contact with a surface of a patient, the electrode comprising:

A. a conductive member; and

B. a conduction enhancer in contact with the conductive member comprising a carrier and a protein/fatty acid based compound.

2. The electrode according to Claim 1, wherein the protein/fatty acid based compound comprises a lipopolypeptide.

3. The electrode according to Claim 2, wherein said lipopolypeptide comprises an acylpeptide.

4. The electrode according to Claim 3, wherein said acyl peptide comprises a material selected from the group consisting of Lamepon S™, MayTein C™, MayTein CT™, and mixtures thereof.

5. The electrode according to Claim 4, wherein said carrier and conduction enhancer provide electrical contact with an electrical resistivity comprising less than about 10K Ohms when said electrode is applied to the patient's surface.

6. The electrode according to Claim 1, wherein said conduction enhancer has an activity between about 0.25% and about 60%.

7. The electrode according to Claim 1, wherein said conduction enhancer has an activity between about 4% and about 50%.

8. The electrode according to Claim 1, wherein said conduction enhancer has an activity between about 5% and about 30%.

9. The electrode according to Claim 1, wherein said conduction enhancer has an activity between about 10% and about 30%.

10. A method for decreasing the electrical resistivity between an electrode and the surface of a patient comprising: placing a carrier and a conduction enhancer comprising a protein/fatty acid based compound between said electrode and said surface.

11. The method according to Claim 10, wherein said protein/fatty acid based compound comprises a lipopolypeptide.

12. The method according to Claim 11, wherein said lipopolypeptide comprises an acyl peptide.

13. The method according to Claim 12, wherein said acyl peptide comprises a material selected from the group consisting of Lamepon S™, MayTein C™, MayTein CT™, and mixtures thereof.

14. The method according to Claim 13, wherein said carrier and conduction enhancer provide electrical contact with an electrical resistivity comprising less than about 10K Ohms when said electrode is applied to said patient's surface.

15. The method according to Claim 14, wherein the electrical resistivity is obtained in about 0.001 seconds to about 3 minutes.

16. The method according to Claim 14, wherein said electrical resistivity is obtained within about 0.01 seconds to about 30 seconds.

17. The method according to Claim 14, wherein said electrical resistivity is less than about 6K Ohms.

18. The method according to Claim 14, wherein said electrical resistivity is maintained for at least about 8 hours.

19. The method according to Claim 14, wherein said electrical resistivity is maintained for at least about 72 hours.

20. The method according to Claim 10, wherein said composition comprises a gelling agent.

21. A composition for enhancing the electrical conductivity between an electrode and a patient's surface comprising:
a mixture comprising a carrier and a protein/fatty acid based compound.

22. The composition according to Claim 21, wherein said protein/fatty acid based compound comprises a lipopolypeptide.

23. The composition according to Claim 22, wherein said lipopolypeptide comprises an acyl peptide.

24. The method according to Claim 23, wherein said acyl peptide comprises a material selected from the group consisting of Lamepon S™, MayTein C™, MayTein CT™, and mixtures thereof.

25. The method according to Claim 24, wherein said carrier and conduction enhancer provide electrical contact with an electrical resistivity comprising less than about 10K Ohms when said electrode is applied to said patient's surface.

26. The composition according to Claim 25, wherein the concentration of said enhancer is at least 0.25%, wherein said electrical conductivity of with said patient's skin when in contact with said enhancer is less than about 10K Ohm.

27. The composition according to Claim 26, wherein said mixture has an activity between about 0.25% and about 60%.

28. The composition according to Claim 27, wherein said mixture has an activity between about 4% and about 50%.

29. The composition according to Claim 28, wherein said mixture has an activity between about 5% and about 30%.

30. The composition according to Claim 21, wherein said mixture has an activity between about 10% and about 30%.

31. The composition according to Claim 21, wherein said mixture comprises a gelling agent.

32. An electrode providing electrical contact with a surface of a patient, said electrode comprising:

A. a conductive member; and

B. a conduction enhancer in contact with said conductive member comprising a carrier and a surfactant represented by the formula:

$$R' - CO - NH \{ CR''H - CO - NH - CRH \}_n COOM$$

wherein R, R', and R" are the same or different and may be independently selected from the group consisting of alkyl, aryl, amine, carbonyl, and

carboxyl moieties; R, and R" may also be independently selected from the group consisting of -H, and -SH;
wherein the repeat unit, n, is an integer from about 2 to about 2000; and
wherein M is a metal ion.

33. The electrode according to Claim 32, wherein when a carbon containing moiety is selected, R , R', and R" have 1-20 carbon atoms.

34. The electrode according to Claim 32, wherein the repeat unit, n, is an integer from about 150 to about 1800.

35. The electrode according to Claim 32, wherein the surfactant is a mixture of compounds selected from said formula.

36. The electrode according to Claim 32, wherein the metal ion, M, is selected from the group consisting of K^+, Na^+, and mixtures thereof.

37. A method for making electrical contact between an electrode and a patient's surface, which comprises the step of applying an electrode having a surface coated with a mixture of a carrier and a conduction enhancer comprising a protein/fatty acid based compound.

38. The method according to Claim 37, wherein said protein/fatty acid based compound comprises a lipopolypeptide.

39. The method according to Claim 38, wherein said lipopolypeptide comprises an acyl peptide.

40. The method according to Claim 39, wherein said acyl peptide comprises a material selected from the group consisting of Lamepon S™, MayTein C™, MayTein CT™, and mixtures thereof.

41. The method according to Claim 40, wherein said carrier and conduction enhancer provide electrical contact with an electrical resistivity comprising less than about 10K Ohms when said electrode is applied to said patient's surface.

42. The method according to Claim 41, wherein said acyl peptide has an activity of at least 0.25%.

43. The method according to Claim 37, wherein said patient's skin is unabraded.

44. The method according to Claim 41, wherein the electrical resistivity is obtained in about 0.001 seconds to about 3 minutes.

45. The method according to Claim 41, wherein said electrical resistivity is obtained within about 0.01 seconds to about 30 seconds.

46. The method according to Claim 41, wherein said electrical resistivity is less than about 6K Ohms.

47. The method according to Claim 41, wherein said electrical resistivity is maintained for at least about 8 hours.

48. The method according to Claim 37, wherein said mixture comprises a gelling agent.

49. A method for the noninvasive measurement of body substances from a patient comprising:

a. applying a multilayer patch to the skin of said patient; wherein at least one layer of said multilayer patch comprises a transdermal migration-enhancing amount of an acyl peptide;

b. measuring a body substance, the transdermal migration of which into said multiplayer patch is facilitated by said acyl peptide.

50. The method according to Claim 49, wherein said acyl peptide comprises a product of coconut oil and hydrolyzed protein.

51. The method according to Claim 49, comprising the additional step of enhancing the migration of said body substance by reverse electro transport.

52. The method according to Claim 51, wherein said reverse electro-transport comprises iontophoresis.

53. A device for measuring the quantity of a body substance in a patient comprising:
a multiplayer patch device comprising;
a first layer comprising an acyl peptide;
a second layer comprising a reaction layer; and
a third layer comprising a readout visible to a user indicative of the level of said body substance in said patient.

54. A method for enhancing patient surface/electrode conduction for electrosurgery in a patient comprising:
applying a conduction enhancing amount of a mixture of a carrier material and a conduction enhancer comprising a protein/fatty acid based compound.

55. The mixture according to Claim 54, wherein said protein/fatty acid based compound comprises a lipopolypeptide.

56. The mixture according to Claim 55, wherein said polypeptide/fatty acid based compound comprises an acyl peptide.

57. The mixture according to Claim 56, wherein said acyl peptide comprises a material selected from the group consisting of Lamepon S™, MayTein C™, MayTein CT™, and mixtures thereof.

58. The mixture according to Claim 57, wherein said mixture of carrier and conduction enhancer provides electrical contact with an electrical resistivity comprising less than about 10K Ohms when said electrode is applied to said patient's surface.

59. A surgical electrode for electrosurgery comprising a conductor and a conduction-enhancing amount of an acyl peptide.

60. An electrode for electrosurgery in a patient comprising:

a. a conductor; and

b. a conduction-enhancing amount of a mixture of a carrier and a surfactant selected from the group consisting of Lamepon S™, MayTein C™, MayTein CT™, and mixtures thereof, wherein said mixture is applied to a surface of said conductor.

61. The electrode according to Claim 60, wherein said conduction enhancer has an activity between about 0.25% and about 60%.

62. The electrode according to Claim 60, wherein said conduction enhancer has an activity between about 4% and about 50%.

63. The electrode according to Claim 60, wherein said conduction enhancer has an activity between about 5% and about 30%.

64. The electrode according to Claim 60, wherein said conduction enhancer has an activity between about 10% and about 30%.